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ABSTRACT

Employment data for the Washington, D.C., metropolitan area were analyzed to determine jobs available to people who had not graduated from high school. Three hundred nine occupations offered at least some openings. These occupations encompassed 584,000 jobs and offered 14,000 openings in an average week. These numbers overestimated jobs available to many chronically poor for three reasons: prerequisites may stand between job seekers and jobs; only a fraction of the job vacancies are widely advertised; and race and sex discrimination limit the number and quality of jobs available to females or members of minority groups. Only one-third of these jobs offered starting wages that exceeded the official federal poverty level for a prototypical family of one adult and two children. At least 50 percent offered no employer-financed health insurance. Sixty percent of the job openings that occurred in a typical week led to a job lasting less than 1 year. Instead of relying on upward mobility within an occupation, workers could increase their qualifications for more attractive occupations. Findings suggested three lessons concerning employment as a strategy for helping people escape chronic poverty: relevance of employment, importance of reducing barriers to employment, and importance of occupational upgrading. (Appendixes include a list of the 309 occupations, list of occupations offering jobs of higher quality, statistical regression analysis, and 97-item bibliography.) (YLB)

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1988

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Greater Washington Research Center

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PREFACE

This report profiles jobs in the Washington metropolitan area that are available to people who have not graduated from high school. The analysis was prepared for the information of people trying to reduce the numbers of Washington, D.C., residents in long-term poverty by increasing their earnings from employment. Jobs that do not require a high school diploma were selected for examination because significant numbers of people in long-term poverty have not graduated from high school.

The report estimates that about 30 percent of all jobs in the metropolitan area do not require a high school diploma. This represents some 584,000 jobs. However, only about one-third of these jobs are both full time and last for a year or more.

The authors describe the numbers of available jobs; discuss various prerequisites for being hired; identify barriers to employment that confront chronically poor workers and potential workers; report on wages, opportunities for advancement, job stability, and the availability of health insurance; discuss what it takes to get the better jobs among those available; and offer several conclusions and policy recommendations. All the jobs available to nongraduates are listed in one appendix; the better nongraduate jobs are listed in another appendix.

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Senior Associate

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SUMMARY

This study examines jobs in the Washington, D.C., metropolitan area that are available to people who have not graduated from high school. This set of jobs was selected because of the strong association between limited education and such urgent public problems as unemployment, welfare dependency, and chronic poverty.

Research findings

The number of jobs available

The general prosperity and rapid growth currently enjoyed by the Washington area generates substantial demand for workers even with limited education. This study identified 309 occupations that offer openings for people who have not graduated from high school. Together, these occupations encompass approximately 584,000 jobs, or 30 percent of all employment in the metropolitan area, and offer approximately 14,000 job openings in an average week.

The 309 occupations fall into eight broad groups: restaurant and fast food workers (115,000 jobs); other unskilled or semiskilled service workers (111,000 jobs); janitors, cleaners, and maids (81,000 jobs); unskilled or semiskilled factory or warehouse workers (67,000 jobs); low-level clerical and office workers (62,000 jobs); sales clerks, cashiers, and stock clerks (61,000 jobs); laborers and other unskilled workers (52,000 jobs); and skilled trade and craft workers (35,000 jobs).

Barriers to getting these jobs

Such figures overestimate the number of jobs actually available to many nongraduate job-seekers for at least three reasons.

First, training and experience requirements may stand between job-seekers and jobs even when a high school diploma is not necessary. Within the 309 occupations, employers prefer high school graduation for 30 percent of the jobs; 62 percent of the jobs require vocational training lasting more than a month; and 69 percent of the jobs require language skills beyond the most basic.

Second, only a fraction of the estimated 14,000 vacancies per week, perhaps as few as one-third, are widely advertised. Most jobs are made known only to a limited range of potential applicants, such as friends and relatives of current employees or residents of the firm's neighborhood. Job-seekers with limited education are often not part of these contact and information networks. This problem is particularly prevalent in the suburbs where more than two-thirds of the 584,000 jobs are.

Finally, race and gender discrimination limit the number of jobs for which minority and female job-seekers may actually be hired, as well as the wages they may earn. Among positions not requiring a high school diploma, the wage difference between jobs traditionally held by white males and those traditionally held by minority females averages $3,700 per year.

Wages and other aspects of job quality

In the Washington area currently, starting wages for jobs not requiring high school graduation average $4.57 per hour, or $9,505 per full-time year. About one-third of these jobs offers starting wages which exceed the official Federal definition of poverty for a prototypical family of one adult and two children. More than 58 percent of the jobs offer no employer-financed health insurance.

If a worker, after getting a job within the 309 occupations, stays in that occupation, his or her wages usually advance modestly over time. The wages a typical worker eventually earns in jobs open to people without high school degrees average $7.55 per hour, or $15,704 per year.

However, many of the jobs initially available to people with limited employment qualifications provide eventual wages which stagnate well below this $15,704 average; two-thirds offer eventual wages which never rise more than 60 percent above initial wages. Furthermore, job stability is relatively unusual in the nongraduate labor market, both because of employee voluntary moves and because of involuntary job terminations; 60 percent of the job openings in a typical week lead to jobs lasting, on average, less than one year.

The relationship between credentials and earnings

Instead of relying on upward mobility within an occupation, workers can increase their qualifications and then switch to more attractive

occupations. While some of the 309 occupations offer wages stagnating at $10,000 or less per year, a limited number eventually pay $20,000 or more. Generally, higher wages are found in occupations requiring more worker qualifications. Holding other factors constant, a job requiring prior experience averages $2,700 more per year than one which does not; a job in which high school graduates are preferred averages $2,600 more per year; and one which requires clear communications skills offers an extra $1,900 per year.

Policy implications

These research findings suggest three important lessons concerning employment as a strategy for helping people escape chronic poverty.

Job availability

The first lesson concerns the large number of jobs identified in this study, reflecting general growth in the Washington area. In such prosperity, it is more feasible for the unemployed, recipients of public assistance, and people with minimal qualifications to get jobs than it is during a recession or in a declining area. The District of Columbia area now offers a "window of opportunity" in which job openings are available even to people with minimal education.

Thus, in the current local market, it is realistic to put increased emphasis on employment as a way to improve the incomes and circumstances of some of the chronically poor. For example, many states are strengthening requirements that public assistance recipients accept work or actively engage in job preparation. In the labor market described by this research, such strengthened requirements, if well designed and thoughtfully implemented, are appropriate.

The importance of reducing barriers to employment

The second lesson tempers the first. Despite this prosperity, it is not realistic to assume that employment is immediately practical for all the chronically poor, or that the employment available pays well enough and is stable enough to offer a permanent escape from poverty.

This is true for three reasons highlighted by the research: lack of skill prerequisites for certain jobs; lack of information about

vacancies; and race and sex discrimination in hiring. Government, employers, and other institutions in the community can take action to reduce these barriers.

The importance of occupational upgrading

Taking such actions is one way to implement an increased emphasis on employment. The other way is to promote the immediate placement of many chronically poor people into jobs.

The limitation of this approach, as the research shows, is that the jobs accessible to low-qualification workers are not usually the first rungs of effective career ladders. Instead, the jobs tend to be "dead ends." To move beyond such jobs requires that the worker first improve his or her educational and other qualifications and then leave the job for a better one. Entry-level jobs help the worker advance by giving him or her the opportunity to establish a work history. However, the worker must also typically improve his or her credentials outside the job.

The implication of this pattern is that efforts to reduce poverty through employment cannot consist solely of moving people into jobs. A second focus must be the upgrading of workers' qualifications. Without provisions for occupational upgrading, an increased emphasis on jobs for low-credential workers will not reduce chronic poverty; rather, it will simply convert many of the "welfare poor" into the "working poor."

I. INTRODUCTION AND OVERVIEW

Modern attention to poverty in America began with President Johnson's declaration of a "war on poverty" in the mid-1960s. Looking back on the twenty years since then, scholars have noted considerable progress in that war, although by no means a complete victory. These same scholars have argued that both the progress and the remaining problems result from the dominance of one public approach: that of reducing poverty by transferring income and goods to the poor. Expansion of programs such as Food Stamps, Aid to Families with Dependent Children (AFDC), Social Security, medical assistance, and housing assistance has been the central thrust of this effort.[1]

In the 1980s, the emphasis in poverty reduction has shifted away from this approach (that of giving income to the poor) toward an approach which enhances the opportunities of the poor to earn income for themselves. Employment, training to prepare for employment, and economic development are the central thrusts of this effort.[2] Included are state and federal initiatives to strengthen the work requirements imposed on public assistance recipients.[3]

The circumstances of the mid-1980s, in part, support this shift in emphasis. The increasing tendency of women, including mothers of young children, to work[4] has modified attitudes about employment for single

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[1]See Haveman (1977), Danziger and Weinberg (1986), and Elwood and Summers (1986).

[2]See Bendick (1982), Mead (1986), Murray (1984), Wanniski (1978), and American Public Welfare Association (1986).

[3]For example, on an experimental basis, some states require public assistance recipients to "work off" their benefits by putting in hours in public agencies at no pay. Other states require that recipients be either employed, actively searching for work, or in training. Still other states offer extensive training and employment assistance, but on a voluntary basis. See Gueron (1987) and Smith (1987).

[4]As of 1984, women constituted 47 percent of the labor force in the Washington area. Among mothers with children under age 6, 55 percent were at work (Outtz, 1986, p. 3, p. 13). For parallel national trends, see U.S. Department of Labor (1983) and Garfinkel and McLanahan (1986).

mothers. Rapid shrinkage of the youth population[5] has increased opportunities for adults to get entry-level employment. The climb of the economy back from the severe recession of the early 1980s toward moderate levels of national unemployment[6] has meant more job opportunities for all workers.

Renewed general prosperity is particularly evident in regions of the country whose economies are attached to expanding sectors (such as business services and high technology). The Washington metropolitan area is one such region, enjoying particularly low unemployment and rapid economic growth. From 1980 to 1985, total employment in the metropolitan area grew more than ten percent, two percentage points above the national average;[7] and the local unemployment rate, at 3.4 percent, stands at only slightly above half the comparable national rate (6.1 percent).[8]

Despite such favorable circumstances, important difficulties constrain the potential role of employment for the poor. Technological changes in production and competition from low-wage workers in developing countries have curtailed the number of jobs in the United States with limited educational prerequisites, particularly entry-level manufacturing jobs.[9] Those jobs which are available may require literacy skills, vocational training, or prior work experience which many poor people do not have. Jobs may not be accessible to poor job-hunters because of the geographic and social distance between suburban job locations and inner-city

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[5]In 1985, workers under age 25 constituted 30 percent of the nationwide labor force. By the year 2000, this proportion will drop to 16 percent (Bendick, 1988a, p. 3; see also Johnston, 1986 and U.S. Department of Labor, 1987).

[6]As of September 1987, the national unemployment rate stood at approximately 6 percent. At the worst point in the previous recession -- in December 1982 -- it had peaked at 10.7 percent.

[7]Henderson (1987).

[8]Unpublished data, Office of State and Local Employment Statistics, U.S. Bureau of Labor Statistics, September 1987. Both rates refer to the civilian labor force in July 1987 and are not seasonally adjusted.

[9]See Bendick (1985b), Office of Technology Assessment (1986), and U.S. Department of Labor (1987). For a discussion of changing employment patterns in the Washington area, see Dearborn (1985).

neighborhoods. Discrimination may reduce the number and quality of jobs available to women and members of minority groups.

Given these difficulties, public policy cannot merely consist of a general "pro-employment" stance. Instead, public decisions need to be based on specific information concerning how many jobs are available, in what occupations they are to be found, where they are located within a metropolitan area, what prerequisites they demand, what incomes they offer in the short run, and what career opportunities they offer in the longer run.[10] This paper reports the findings of a study which developed quantitative information on these subjects for the District of Columbia and its surrounding metropolitan area.

The relationship between chronic poverty and limited education

The ultimate focus of the present research (and the broader research program of which it is part)[11] is people in the Washington metropolitan area who are mired in long-term poverty or at risk of becoming so.[12] However, being poor is not itself a labor market characteristic. For example, a potential employer would not list "being poor" in a job advertisement to

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[10]Parallel information is also required on the characteristics of workers. The present report looks primarily at the demand for workers -- from the point of view of employers -- not the extent to which potential job-seekers from among the chronically poor in the Washington area can meet those demands. Information on the latter subject is provided by Grier and Grier (1988).

[11]The present study was commissioned as part of a larger research program on prospects for increased earnings by the chronically poor in the Washington area, funded by the Rockefeller Foundation and administered by the Greater Washington Research Center. For other products of this program, see Dearborn (1988), Gregory (1988), and Grier and Grier (1988).

[12]Long-term poverty -- also referred to in this paper as chronic or persistent poverty -- means that a person is poor not only in the present but has remained poor (or is likely to remain poor) over an extended period. Among people who are poor at any moment, some will tend to rebound from that state fairly rapidly, often due to such changes in personal circumstances as getting married or finding a job. For example, among all people in poverty in the year 1979, only about 39 percent were in poverty for most or all of the period 1974 through 1983 (Adams and Duncan, 1988, p. 4). It is this latter group which is considered a particularly serious and perplexing public problem and is the focus of the larger research program of which this study is part (see footnote 11).

describe the requirements for being hired. Because the present study is about jobs and their prerequisites, it was necessary to define the set of jobs to be examined in other terms.

The characteristic selected was that some of the vacancies in the occupation could be filled by people without high school diplomas.[13] It is well known that there is a strong relationship between limited education and poverty. In 1979, while only 29 percent of adult heads of all households in the United States had not completed high school, 78 percent of adult heads of household in chronic poverty had not done so (Adams and Duncan, 1988, p. 5).

Of course, the jobs not requiring a high school diploma are not reserved for poor people. Nor, conversely, do all the chronically poor lack diplomas. Therefore, the empirical results in this study should not be regarded as precise estimates of the jobs available to the poor; in particular, it is inappropriate to compare the estimated numbers of jobs to the estimated number of poor people and conclude that there are (or are not) enough jobs to go around. Rather, it is more appropriate for the findings in this report to be used to explore the labor market in which the poor primarily find themselves, to understand the opportunities and constraints confronting them. The purpose of this report is not just to count job openings, but rather to define what those openings represent.

The findings presented throughout this report are based on a detailed statistical analysis of employment data for the Washington metropolitan area. This analysis is documented in Appendices A through D.[14]

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[13]To some extent, employers may regard the credentials of job-seekers holding diplomas from inner-city high schools as similar to those of high school dropouts. Much of the analysis in this report may apply to these workers as well.

[14]Appendix A presents a detailed listing of the 309 occupations identified in this report as open to Washington-area job-seekers lacking a high school diploma. Appendix B lists 107 of those occupations that account for at least 100 jobs for nongraduates and fulfill five standards of job quality. Appendix C describes the methodology used in selecting these occupations and in profiling their characteristics. Appendix D reports how some estimates presented in the text were derived from these data by use of the statistical technique of multiple regression analysis.

II. THE NUMBER OF JOBS AVAILABLE

Overall employment in the Washington metropolitan area

Under the sponsorship of the District of Columbia Occupational Information Coordinating Committee, the Labor Market Information Division of the District of Columbia Department of Employment Services (DOES) has produced a forecast of expected employment in 1990 in the Washington metropolitan area[15] in each of 882 detailed occupations (for example, gas pump attendant or termite fumigator helper) (DOES, 1985). These estimates are based on the actual number of people employed in these occupations as of 1980, which are then projected to 1990 using standard techniques and assumptions developed by the federal Bureau of Labor Statistics.[16] These numbers represent the best available profile of Washington-area employment in 1990 and the employment patterns in the metropolitan area today.

The 882 occupations covered by the DOES projections encompass 1,964,000 jobs. Table 1 presents estimates of the numbers of jobs in major categories in both 1980 and 1990. These data again show how rapidly total employment is growing in the area; the total of 1,964,000 jobs in 1990 is 23.4 percent higher than the corresponding figure in 1980, representing a 2.3 percent annual rate of growth. In contrast, between 1980 and 1986 the population of the Washington area has grown at an annual rate of 1.6 percent (Feinberg, 1987, p. A10).

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[15]In this report, the Washington, D.C., metropolitan area is defined as the District of Columbia, Montgomery County, Prince George's County, Arlington County, the city of Alexandria, Loudon County, Prince William County, Fairfax County, and Charles County.

[16]Among the major assumptions underlying these projections are that the national economic institutional framework will not change substantially between 1980 and 1990; that current social, technological, and scientific trends will continue; that no major event will significantly alter the industrial structure of the economy or alter the rate of economic growth; that industrial staffing patterns will change slowly; and that the economy will gradually approach full employment over the period (DOES, 1985, p. ii).

Table 1
Total employment in the Washington metropolitan area, 1980 and 1990

Occupational Group	1980* Number	1980* Percent	1990+ Number	1990+ Percent	Annual % Growth 1980-1990
Professional, technical, and kindred workers	418,300	26.3%	531,300	27.0%	2.7%
Managers and officials	157,500	9.9	191,500	9.8	2.2
Sales workers	87,200	5.5	113,700	5.8	3.0
Clerical workers	418,600	26.3	505,000	25.7	2.1
Craft and kindred workers	131,100	8.2	153,600	7.8	1.7
Operatives	76,700	4.8	92,500	4.7	2.1
Service workers	231,000	14.5	296,900	15.1	2.9
Laborers	71,200	4.5	78,900	4.0	1.1
Total	1,592,200	100.0%	1,964,000	100.0%	2.3%

Source: DOES (1985), Table II, p. 6.

Note: Details might not add to totals due to independent rounding.

*actual

+projected

Within this overall growth, the occupational groups with the highest forecasted growth rates for the decade are sales (3.0 percent growth annually), services (2.9 percent), and professional, technical, and kindred workers (2.7 percent). In 1990, these same three occupations are projected to provide a large proportion of total jobs in the Washington area, with professional/technical occupations representing 27.0 percent of total employment, clerical comprising 25.7 percent, and services accounting for 15.1 percent. The category of laborers is both the smallest occupational group in Table 1 (providing only 4.0 percent of jobs in 1990) and the slowest growing (a 1.1 percent annual rate of growth). Thus, while employment is growing in all occupational groups, those demanding more education are generally growing fastest. The Washington area, whose economy traditionally has been heavily weighted toward management and the professions[17] and

[17]In 1980, when 26.6 percent of employment nationwide consisted of managerial, professional, and technical positions, these groups accounted for 36.2 percent of employment in the Washington area (DOES, 1985, p. 7).

whose labor force has traditionally been better educated than that of the nation as a whole,[18] continues to develop in an education-intensive direction.

Jobs not requiring a high school diploma

In reflection of these trends, many of the occupations shown in Table 1 have substantial educational prerequisites. The next step in our analysis is to remove from consideration those occupations requiring a high school diploma (or G.E.D. equivalent).[19] This criterion deletes virtually all technical, managerial, and professional occupations; excludes some craft, clerical, and sales occupations; and leaves available many laborer, service, and operative occupations.[20] Table 2 summarizes the 309 occupations remaining. The 584,000 jobs found here represent about 30 percent of the total jobs forecast for 1990. A full list of the 309 occupations is in Appendix A.

Table 2 indicates that the largest number of nongraduate jobs -- accounting for 20 percent of all jobs not requiring a high school diploma -- is in the category of restaurant and fast food employment. Other unskilled or semi-skilled service jobs -- ranging from manicurist/shampooer to parking lot attendant -- account for another 19 percent. Janitors, cleaners, and maids is the next largest group, 14 percent, and unskilled factory, clerical, and sales clerk jobs contribute about 11 percent each. Unskilled laborer positions account for an additional 9 percent, while skilled trades and crafts jobs represent the final 6 percent.

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[18]In 1980, 79.4 percent of people age 25 or older in the Washington metropolitan area had completed high school, compared to an average of 69.3 percent for the ten largest metropolitan areas in the nation in that same year and 66.5 percent for the nation as a whole (Grier and Grier, 1985, p. 261).

[19]Throughout this report, a G.E.D. certificate is assumed to be equivalent to a high school diploma. The extent to which employers actually treat it as such has never been documented.

[20]A variety of sources were consulted in determining which occupations require a high school diploma. These include research publications of the federal Bureau of Labor Statistics, discussions with local employers, and examination of job vacancies listed in Washington-area newspapers and with the District of Columbia Job Service. This process is documented in detail in Appendix C.

The figures in Table 2 refer to the total number of jobs in each occupation, including many that are currently filled. Job vacancies are created when a worker leaves a job and is replaced, or when a new position is added. It is estimated that these 584,000 jobs correspond to about 14,000 job openings per week.[21]

Table 2
Jobs in the Washington metropolitan area not requiring high school graduation, 1990

Occupational Group	Number of Jobs	Percent of Jobs
Restaurant and fast food workers	115,000	20%
Other unskilled or semi-skilled service workers	111,000	19
Janitors, cleaners, and maids	81,000	14
Unskilled or semi-skilled factory/warehouse workers	67,000	11
Low-level clerical workers	62,000	11
Sales clerks, cashiers, and stock clerks	61,000	10
Laborers and other unskilled workers	52,000	9
Skilled trades and crafts	35,000	6
Total	584,000	100%

Source: See text and Appendices A and C.

Are there enough jobs to employ every poor person?

Such figures are strikingly large. The number of nongraduate jobs available totals more than half a million and constitute nearly one job in three among all jobs in the metropolitan area. Even in the "high technology" era, and even in a region where the work force is highly educated, many jobs are available to people who haven't finished high school.

Is it reasonable to interpret these numbers to mean that there is a job available for every poor person? Is it appropriate to conclude that there is no excuse for anyone wanting to work not to be working? A recent survey estimated that 54,000 poor people of working age live in the District of Columbia (Grier and Grier, 1988, p. 16). Is it appropriate to

[21]Appendix C to this report describes the assumptions and statistical methods used to generate this estimate.

compare this number to the estimate of 14,000 openings per week and decide that there are enough jobs for every one of these people to become employed?

There are at least three reasons why it is not appropriate to do so.

The first and most obvious is that many of these 54,000 people already have jobs. The same survey reported that 46 percent of them, or nearly 25,000 people, are at work and yet still poor (Grier and Grier, 1988, p. 16).

The second reason is that the number of poor people just cited is simply a "snapshot" at one moment of what is a constant flow into and out of poverty. Should every one of those people become employed today (and, in fact, some do leave the poverty rolls each day by doing exactly that), their numbers would be replenished by others falling into poverty. Thus, it is an over-simplification of this dynamic process to consider only the static figures of number of people versus number of jobs.

The third reason is that these jobs are not reserved for the poor or for people without high school diplomas. Employers routinely adjust their hiring criteria to match the quality of available applicants. If job applicants with diplomas are available, employers will often hire them. Similarly, a job may require other qualifications which chronically poor people do not possess. These considerations are the subject of the next section of this report.

III. PREREQUISITES FOR BEING HIRED

The occupations and jobs listed in Table 2 share the quality of not requiring a high school diploma. However, various skills or abilities may be required by the jobs, among them literacy and language skills, arithmetic skills, physical strength, and specialized vocational skills. For example, a garbage collector needs substantial physical strength, while a file clerk needs good language skills.[22] To understand whether such job opportunities are relevant to the chronically poor, it is necessary to examine the extent to which such prerequisites might stand between a person and a job.

Language and mathematical prerequisites

Many jobs not requiring a high school diploma still require skills traditionally learned in secondary school. Thus, people without diplomas may not be able to get various jobs not because they do not have the diploma but because they do not have the skills that the diploma represents. Indeed, people who do not finish high school typically have functional skill levels far lower than their years of education would suggest; this pattern is particularly prevalent among minority students. For example, several studies have estimated that a typical high school dropout from the eleventh grade actually has no more than an eighth grade level of reading skills (Romero, 1987; Bendick and Cantu, 1978; Bendick, 1987).

Table 3 shows the levels of language skills required for the 309 occupations examined in this study, using a scale of reading skill levels developed by the U.S. Department of Labor. Only a small percentage of nongraduate jobs require that the job holder command a relatively sophisticated level of language. However, this does not mean that a worker's

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[22]As Appendix C documents in detail, this section is based on widely-recognized analyses, produced by the federal Bureau of Labor Statistics, of the prerequisites for workers to be fully functioning in an occupation. Depending on what job-seekers are available, employers may require new hirees to possess more than these credentials, or they may hire persons who do not meet these requirements. Thus, this analysis should be taken to indicate the general level of qualifications typically required of occupations rather than precise statements of the prerequisites associated with every vacancy.

language skills can be weak or nonexistent for him or her to succeed in most of these jobs. While one-third of the jobs require only basic communication skills (labeled "level one" in the table, representing the ability to speak simple sentences and recognize a basic vocabulary), sixty-five percent require a level of skill of two or three. For level two jobs -- such as keypunch operator or taxi driver -- the job holder must be able to speak clearly and distinctly and read basic instructions. Level three jobs -- such as sales clerk or camera repairer -- require the job holder to be able to write simple reports, speak before a group, and read shop equipment instructions.

Table 3
Language skills required for Washington-area nongraduate occupations

Level of skill required	Examples of skill level	Percent of all nongraduate jobs	Examples of occupations
1	Speak simple sentences; print simple sentences; recognize 2,500 words of 2 or 3 syllables.	31%	Picture framer; packer; oiler
2	Speak clearly and distinctly; write complex sentences; read comic books and instructions for assembling model airplanes.	32	Keypunch operator; bindery worker; taxi driver
3	Speak before a group; write reports; read magazines and shop equipment instructions.	33	Typist; mechanic; fast food cook
4	Participate in debates; read novels, encyclopedias; write reports.	4	Sales clerk; camera repairer; stone cutter & carver
5	Be conversant with the theory of communication; write novels and poetry; read literature.	0	--
6	Same as 5.	0	--
Total		100%	

Source: See text and Appendix C. Skill levels 1 through 6 are defined in U.S. Department of Labor (1981), pp. 469-471.

Table 4 shows the levels of arithmetic skills required for the 309 occupations examined in this study, again using a scale of skill levels developed by the U.S. Department of Labor. Advanced mathematical skills are not required for most of these jobs. Indeed, 41 percent of the jobs (in occupations such as kitchen helper and packer) require only the ability to add and subtract. However, many nongraduate jobs have mathematical skill prerequisites beyond the elementary school level. The table indicates that more than half of the jobs (58 percent) require skills of levels two or three. Level two skills -- such as familiarity with fractions, ratios, and bar graphs -- is considered necessary in such occupations as typist, painter, bricklayer or fast food cook. Level three skills -- such as the ability to use simple algebra and geometry and compute discounts and markups -- is considered necessary for occupations such as cashier, tile setter, and locksmith.

The importance of basic reading, language, and arithmetic skills for many jobs is a theme repeatedly struck in the literature on problems of employing the hard to employ. It recurs whether the job-seekers being discussed are recipients of public assistance, young school dropouts, or middle-aged workers losing their jobs to advancing technology.[23] This is consistent with the emphasis in efforts to help the disadvantaged on increasing the effectiveness of inner city education, on the prevention of school dropouts, and on remedial adult education.

Strength prerequisites

Certain jobs among the 309 nongraduate occupations will not be realistic for some members of the job-seeking population because of requirements for physical strength and agility. This may be an issue, for example, for people with physical disabilities, some older workers, and some women.

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[23]See Bendick (1985a), Bendick (1985b), Bishop (1985), Christensen (1982), Duggan (1985), Romero (1987), Saks (1983), U.S. Department of Labor (1987), and Vice President's Task Force (1979).

Table 4
Mathematical skills required for Washington-area nongraduate occupations

Level of skill required	Examples of skill level	Percent of all nongraduate jobs	Examples of occupations
1	Add and subtract 2 digit numbers; perform basic arithmetic with coins.	41%	Kitchen helper; crane operator; packer
2	Add, subtract, multiply, and divide; handle fractions, ratios, percents, and bar graphs.	36	Typist; fast food cook; bricklayer
3	Compute discounts, percentages, and markups; use simple algebra and geometry.	22	Cashier; tile setter; locksmith
4	Use shop math including geometric constructions and trigonometry; use basic statistics.	1	Tool & die maker; drywall installer; camera repairer
5	Apply algebra, calculus, and statistics.	0	--
6	Apply advanced calculus and mathematical statistics.	0	--
Total		100%	

Source: See text and Appendix C. Skill levels 1 through 6 are defined in U.S. Department of Labor (1981), pp. 469-471.

Table 5 shows the levels of physical strength required for occupations, as analyzed by the U.S. Department of Labor. This scale ranks each occupation on a scale of one to five, reflecting the weight that a worker would typically be required to lift.

Table 5
Strength requirements for Washington-area nongraduate occupations

Strength requirements	Percent of all jobs not requiring high school graduation	Examples of occupations
Sedentary work	8%	Order clerk; dispatcher; jeweler
Light Work (lifting ≤ 20 lbs.)	40	Sales clerk; picture framer; cable splicer
Medium Work (lifting ≤ 50 lbs.)	34	Vendor; packer; carpenter
Heavy Work (lifting ≤ 100 lbs.)	18	Plumber; appliance installer; mechanic; baker
Very Heavy Work (lifting > 100 lbs.)	.4	Dry wall installer; garbage collector; freight handler
Total	100%	

Source: See text and Appendix C. Levels of lifting requirements are defined in U.S. Department of Labor (1981), pp. 465-466.

Note: Details might not add to totals due to rounding.

According to the data, nearly half of the nongraduate jobs fall into occupations which are either sedentary (requiring virtually no lifting) or which require only light work (lifting less than twenty pounds). These categories include jobs such as order clerk, manicurist, cashier, and camera repairer. Medium strength work, requiring lifting up to 50 pounds, encompasses another 34 percent of the jobs and includes many skilled trade jobs, such as carpenter, plumber, tile setter, and bricklayer, as well as many less-skilled jobs such as vendor, laborer, and packer. Heavy and very heavy jobs account for slightly more than 18 percent of the jobs. These

categories are defined as requiring lifting of 50 pounds and more and encompass a mixture of skilled trade jobs, such as plumber, mechanic, and dry wall installer, and lesser-skilled positions such as material handler and garbage collector.

Vocational training requirements

Another important prerequisite to success in many of the occupations is specific vocational training. In the U.S. Department of Labor's analysis, this is measured by the amount of training time required to achieve average performance in a specific job.[24] This analysis does not distinguish between time spent in formal classroom training and that spent in less organized in-plant or on-the-job learning.

Table 6 summarizes the vocational training time needed for various jobs. The data show that a substantial proportion of the jobs require only modest training times; 39 percent can be learned in one month or less, and an additional 27 percent can be learned in one to three months. These jobs come from such occupations as tire changer, vendor, switchboard operator, and kitchen helper. Training time of three months to a year is considered necessary for about 19 percent of the jobs, including those in such occupations as nurse's aide, carpet cutter, and cashier. A final 16 percent of jobs -- such as locksmith, electric tool repairer, and the skilled construction trades -- are in occupations requiring between one and four years of training.

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[24]These times exclude orientation training given to all new employees and assume that other prerequisites for the job, such as basic language and mathematical skills, are already in place. Thus, training programs for these jobs might be longer than these times if general educational remediation, general work readiness, or other kinds of preparatory training are provided.

Table 6
Vocational training requirements for Washington-area nongraduate occupations

Amount of Vocational Training Required	Percent of nongraduate jobs	Examples of Occupations
≤ 1 month	39%	Vendor; office clerk; kitchen helper; riveter
≤ 3 Months	27	Packer; tire changer; switchboard operator
≤ 6 Months	15	Sales clerk; nurse's aide; sander
≤ 1 Year	4	Cashier; carpet cutter
≤ 2 Years	8	Locksmith; electric tool repairer; appliance repairer
≤ 4 Years	8	Plasterer; carpenter; bricklayer
Total	100%	

Source: See text and Appendix C. Vocational training requirements are defined in U.S. Department of Labor (1981), p. 473.

Note: Details might not add to total due to rounding.

IV. OTHER BARRIERS TO EMPLOYMENT

Of course, even a worker who meets all the skill and strength prerequisites for a job does not automatically get it. Three barriers which often stand between qualified workers and getting hired are: lack of transportation to jobs, lack of information about job vacancies, and race and gender discrimination.

Transportation to jobs

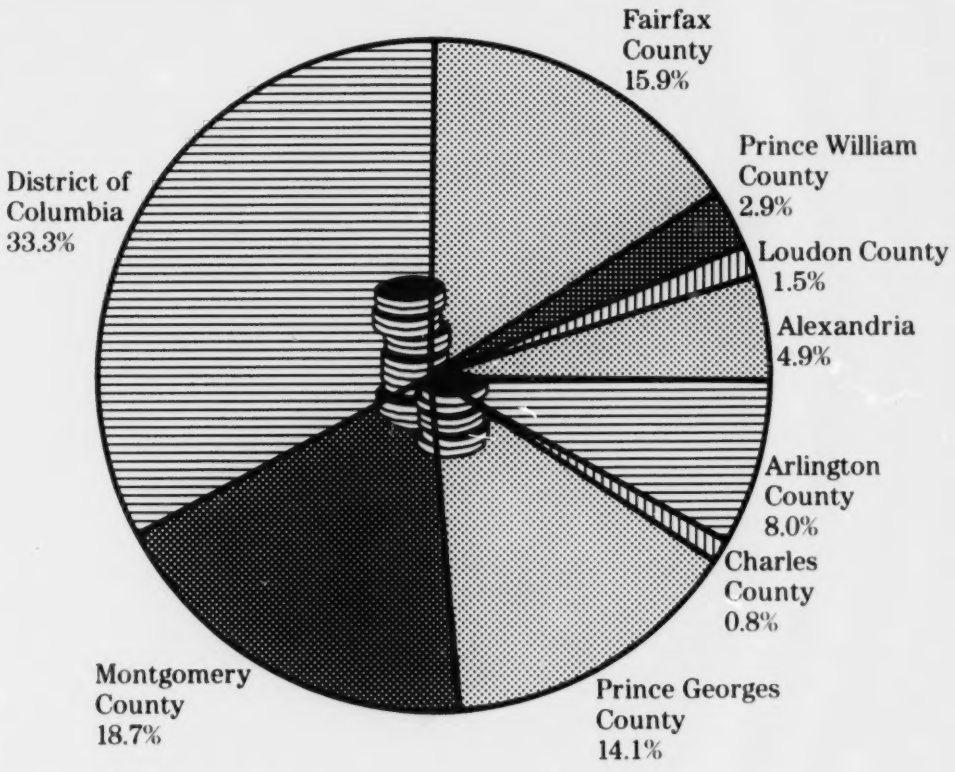
The geographic distribution of all employment within the Washington metropolitan area, as projected for the year 1990 by the Washington Council of Governments (Metropolitan Washington Council of Governments, 1986), is shown in Figure 1. The largest proportion of jobs (45 percent) will be found in the inner suburban ring surrounding the District of Columbia. The District of Columbia itself accounts for 33 percent of the jobs, while the remaining 22 percent are found in the outer suburban ring of the metropolitan area.

The decentralization of employment in the Washington area is increasing. While the number of jobs is growing throughout the metropolitan area, the number is growing faster in the suburbs and especially the far suburbs. According to the Metropolitan Washington Council of Governments, between 1980 and 1985, while total employment in the District of Columbia grew 3.0 percent, that in Loudon County grew 34.9 percent, in Fairfax County 18.1 percent, and in Montgomery County 16.2 percent (Henderson, 1987, p. A20). Thus, employment in the future will continue to become even more suburbanized than is indicated in Figure 1.

It is also important to note that these data refer to all employment. Unfortunately, no comparable data are available on the location of nongraduate jobs. However, it is known from national experience that entry-level, low-qualification employment is becoming suburbanized faster than is all employment. The job growth in center cities consists disproportionately of "knowledge-intensive" jobs with considerable educational

Figure 1

The geographic distribution of employment in the Washington metropolitan area



Source: See text and Appendix C

prerequisites.[25] Thus, Figure 1 overestimates the availability of nongraduate jobs in the center city and the near suburbs. While we cannot provide an exact figure for the proportion of areawide nongraduate jobs located in the District of Columbia, it is clear that 33 percent is an upper limit.

The suburbanization of employment raises the question of access to jobs for the chronically poor, many of whom live in the District. Jobs located in the far suburbs are difficult to get to, and the geographical concentration of the poor is not likely to change. The poor do not move close to suburban jobs because of higher suburban rents, race discrimination in housing, and reluctance to part from their inner city social ties and city support services.[26] Furthermore, in "doubled-up" families or households shared by several breadwinners, moving close to one job does not necessarily mean moving close to another.

Public transportation is an important consideration in job accessibility. According to a recent survey, 53 percent of the District's poor of working age live in households with no car (Grier and Grier, 1988). Public transportation may be difficult, time consuming, or not available to many job sites in the far suburbs.

Do these facts together identify a major barrier to employment for many of the chronically poor in the Washington area? Certainly transportation poses some difficulty for many and insurmountable difficulty for some. However, it may be less central than one might suppose.

During the late 1960s, transportation difficulties were considered a major factor contributing to unemployment and poverty. In investigating the underlying causes of the Watts riots in car-oriented Los Angeles, the McCone Commission stated:

> Our investigations have brought into clear focus the fact that the inadequate and costly public transportation currently existing throughout the Los Angeles area seriously restricts the residents of the disadvantaged areas such

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[25]For example, in New York City over the decade from 1970 to 1980, employment in industries where the average educational level of employees was less than 12 years declined by 38.2 percent, while employment in industries where the average education of employees exceeded 14 years rose by 24.9 percent (Kasarda, 1985, pp. 49-51).

[26]See Kain (1968) and U.S. Department of Housing and Urban Development (1980).

> as south central Los Angeles. The lack of adequate transportation handicaps them in seeking and holding jobs, attending school, and fulfilling other needs.[27]

In response to this belief, the federal government sponsored demonstration projects in fifteen cities during the late 1960s specifically designed to help low-income urban residents commute to suburban jobs.[28] These projects created 83 new transit routes connecting central city ghettos with large concentrations of suburban plants and offices. One route linked Chicago's O'Hare Airport (where 19,000 people worked) to the Chicago rapid transit lines. Several routes were created in Los Angeles to connect Watts with the Los Angeles Airport, a large General Motors assembly plant, and an industrial enclave called the City of Commerce. A third demonstration connected Boston's inner city to the rapidly growing electronics industry scattered along suburban Route 128.

The results of these demonstrations were clear, consistent, and fatal to the contentions of the McCone Commission. The majority of the routes attracted very little ridership; what ridership there was tended to fall off after the riders had been working long enough to buy cars; and very few job placements could be attributed to the availability of the transportation. A study of the Chicago line to O'Hare Airport, for example, identified only 88 regular commuters who had been hired subsequent to the opening of the line and who depended on the line to get to their jobs. Moreover, half of these riders stopped using the service within one year. It seems that shared rides or car pools provided the necessary transportation, and that getting a job was often quickly followed by getting a car.

Despite this optimistic conclusion, however, the issue of transportation does highlight two other important issues in employment for the chronically poor. The first is the problem of low wages. Wages may be so low that the time and expense of traveling to a distant job cannot be justified. The second is the problem of access to information about job

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[27]Quoted in Altschuler et al. (1979), p. 26.

[28]This discussion is based on Altschuler et al. (1979), pp. 27-29. For other evidence supportive of the same conclusions, see Ellwood (1986) and Kain and Meyer (1970).

vacancies: that information may not reach poor job-seekers who live and socialize in neighborhoods far from those where the jobs are.

Information about job vacancies

In some occupations, job vacancies are publicly announced and are open for widespread application. But often this is the exception rather than the rule. In many occupations, information about vacancies is tightly controlled and is, in practice, available only to a limited circle of job-seekers such as current members of a union, friends or relatives of current employees, and friends or acquaintances of employers. In the entire American labor market, approximately one-third of job vacancies are filled exclusively through personal referral networks, one-third through direct application at the work site (sometimes in conjunction with personal referrals), and only one-third through public channels such as newspaper advertisements or Job Service listings.[29]

Unfortunately, the chronically poor are not often part of these personal contact networks and informal information channels. They are not friends or neighbors of people already working in the company. Nor are they, their neighbors, and their relatives members of unions. Therefore, they may not hear about the two-thirds of all jobs that are not publicly advertised. This problem can be particularly acute for jobs located in the suburbs, where, as noted previously, more than two out of three jobs in the Washington area are located.

This lack of information about job vacancies can be a major barrier to employment. And because the better the job is, the more tightly information about openings is generally held, this is a particular difficulty in getting jobs which offer higher wages and greater opportunities for advancement. Consequently, estimates concerning the number of available jobs must be considered overestimates of the jobs realistically available to the poor, and the average wages attached to these jobs must also be considered overestimates.

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[29]See Bendick (1988b), p. 6, Bishop, Barron, and Hollenbeck (1983), and Holzer (1987). These proportions vary by level of job -- the better the job, the more likely it is not to be publicly advertised -- and by the tightness of the job market (in tight labor markets, employers try more channels of recruitment, including public advertising).

Race and sex discrimination

Another reason that not all nongraduate jobs are actually available to all chronically poor job candidates is discrimination on the basis of race or sex. Of course, employment discrimination on these bases is illegal under various federal and local laws. Nevertheless, it continues to exist.[30]

More estimates are available of discrimination revealed in wages than in access to jobs. However, analyses by the U.S. Commission on Civil Rights of nationwide employment in March of 1980 give some indication of restrictions on job access. The Commission estimated that 65.2 percent of white males in the labor force were then working in jobs which used their educations, provided steady, full time employment, and paid wages not artificially depressed by discrimination. By contrast, only 55.4 percent of white females, 46.9 percent of black males, and 39.1 percent of black females achieved this degree of labor market success (Gordon, Hamilton, and Tipps, p. 5). By this measure, holding qualifications constant, the employment prospects for white females are only 85 percent as good as those for white males; those for black males are only 72 percent as good; and those for black females are only 60 percent as good.

A recent survey of the working-age poor in the District of Columbia estimates that 95 percent are members of minorities and 61 percent are female (Grier and Grier, 1988). Nonminorities and males have access to more and better jobs than do either of these groups; clearly, fewer of the good nongraduate jobs are realistically available to the chronically poor.

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[30]See Bendick (1985a), Boggs (1985), Ehrenberg and Smith (1985), Chapter 14, Leonard (1983), and Payton (1984).

V. WAGES AND OTHER ASPECTS OF JOB QUALITY

Jobholding involves many considerations of quality other than starting wages. These include such things as stability of employment, opportunity for advancement, and the availability of fringe benefits. What are the profiles for these aspects of employment for nongraduate jobs?

Starting wages

Figure 2 shows the distribution of typical initial wages in the 309 nongraduate occupations. Wages are shown as annual earnings on a full-time basis.[31] Annual earnings range from slightly under $8,000 per year ($3.85 per hour)[32] to $20,000 ($9.61 per hour). However, earnings in the lower parts of this range are far more common than in the upper reaches. Wages under $8,000 per year are paid by 31 percent of the jobs; and an additional 39 percent pay between $8,000 per year and $10,000 per year ($4.81 per hour). Only 8 percent of the jobs pay more than $14,000 per year ($6.73 per hour), and the average starting wage is $9,505, or $4.57 per hour.

To put these numbers in perspective, Figure 2 shows three levels of income against which to compare the numbers.

- The first level, marked "welfare," is set at $7,600 per year (corresponding to $3.65 per hour). This is an estimate of the yearly income provided by public assistance in the District of Columbia to a prototypical family of one adult and two children, through a combination of Aid to Families with Dependent Children (AFDC), Food Stamps, and Medicaid.[33]

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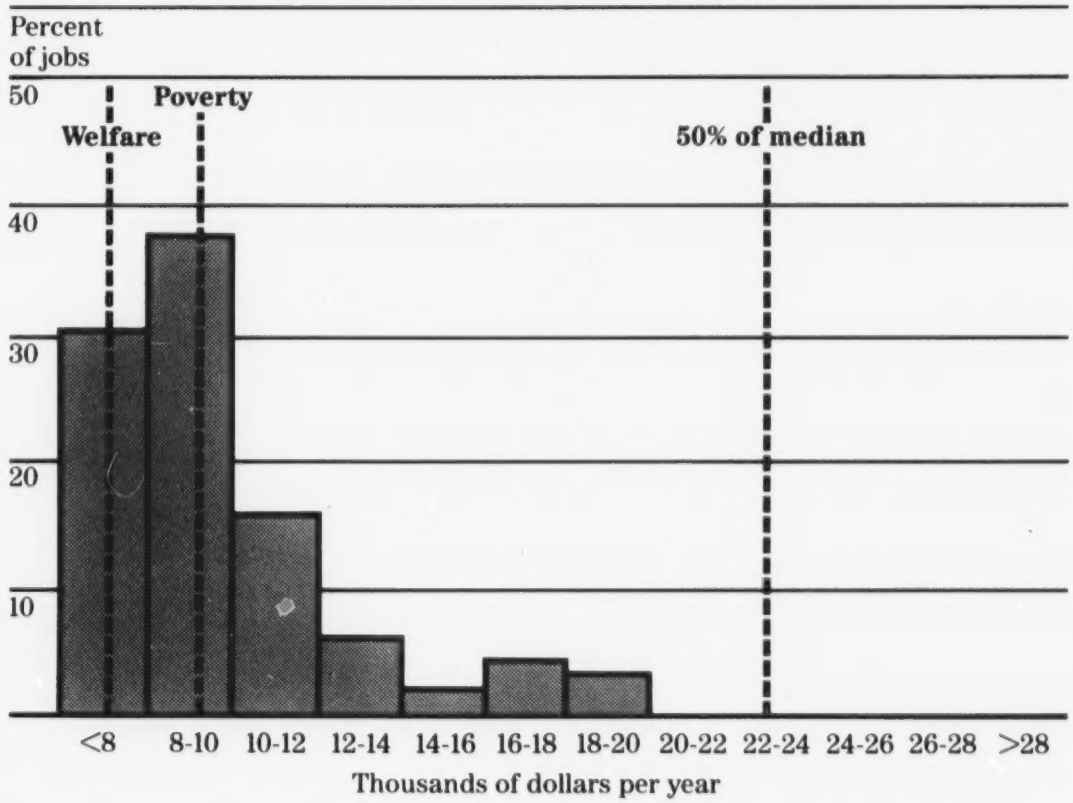
[31] That is, for 2080 hours (52 weeks at 40 hours per week). This obviously suppresses a great deal of variation in actual working arrangements, including the fact that some jobs routinely involve either fewer or more than 40 hours per week, some workers hold multiple jobs, and some jobs involve seasonal or periodic layoffs.

[32] Only a very small number of occupations (such as actor) were estimated to offer starting wages lower than the Federal statutory minimum wages of $3.35 per hour ($6,969 per year).

[33] The $7,600 estimate is based on a highly simplified analysis of a very complicated set of program rules. Dearborn (1988) analyzes these rules in more detail.

Figure 2

Annual earnings at starting wages for Washington-area jobs not requiring high school graduation



Source: See text and Appendix C

- The second level, marked "poverty," is set at $9,100 per year (corresponding to $4.38 per hour). This is the level of income, defined by the federal government in 1987, below which the same prototypical family is considered to be in poverty.[34]
- The third level, marked "50 percent of median," is set at $22,700 per year (corresponding to $10.91 per hour). This number is set at 50 percent of the median family income in the Washington metropolitan area which, in 1987, was approximately $45,400 per year. Social scientists sometimes use incomes of 50 percent of the median as representing a level of living which is "fully middle class" or "mainstream" in relation to local income norms (Fuchs, 1967).

Evaluating the income levels provided by employment is, of course, more complicated than these three simple comparisons suggest. The costs of working must also be considered (among them are child care, transportation, and clothing) as well as the ways in which public programs (such as public assistance and the Federal Earned Income Tax Credit) may supplement earnings (Dearborn, 1988). Nevertheless, the three standards offer some comparison by which to judge the earning levels for nongraduate jobs.

The data suggest that what those earnings represent is a standard of living generally lower than two of the three standards but generally above the third. In comparison to the "50 percent of the median" standard, no nongraduate jobs provide that level of income; indeed, about two-thirds of the jobs fail to provide even half that amount. In relation to the poverty standard, 68 percent of the jobs offer starting wages which would not raise a prototypical family of three over that threshold. However, 97.5 percent of the jobs pay more than welfare. Thus, while only a minority of the jobs offer an immediate escape from poverty, virtually all

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[34]If the family is larger, the poverty threshold figure is higher; if smaller, the figure is lower. See Plotnick and Skidmore (1975).

of them offer a standard of living at least somewhat higher than what might be available from public assistance.[35]

Eventual wages

Figure three repeats the presentation and comparisons in Figure 2, for "eventual wages" rather than starting wages. By eventual wages, we mean the typical earnings which a worker can expect after he or she has stayed in an occupation over time. Eventual wages are higher than starting wages in reflection of the increased productivity which workers may develop with experience, the tendency of wages to rise with seniority, and the wage increases which a worker may get by moving to better jobs within an occupation.

Figure 3 shows that eventual wages for nongraduate jobs average $15,704 annually, or $7.55 per hour. The range is from about $8,000 per year ($3.85 per hour) to as much as $28,000 per year ($13.45 per hour). The majority of jobs fall somewhat below the $7.55 average, with 35 percent paying between $12,000 and $14,000 per year ($5.77 to $6.73 per hour) and an additional 34 percent paying between $14,000 and 18,000 per year ($6.73 to $8.65 per hour).

Figure 3 shows that eventual wages for the majority of nongraduate jobs are competitive with two of the three comparison standards. One hundred percent of the jobs, if full time, offer earnings above the welfare level for the prototypical family of three; indeed, 43 percent of the jobs pay at least twice that level. Similarly, 99 percent of the jobs pay more than the $9,100 poverty level. However, the income representing a "full middle class" level of living ($22,700) continues to exceed the earnings in the vast majority of the jobs; only 13 percent of the jobs can match or exceed that level.

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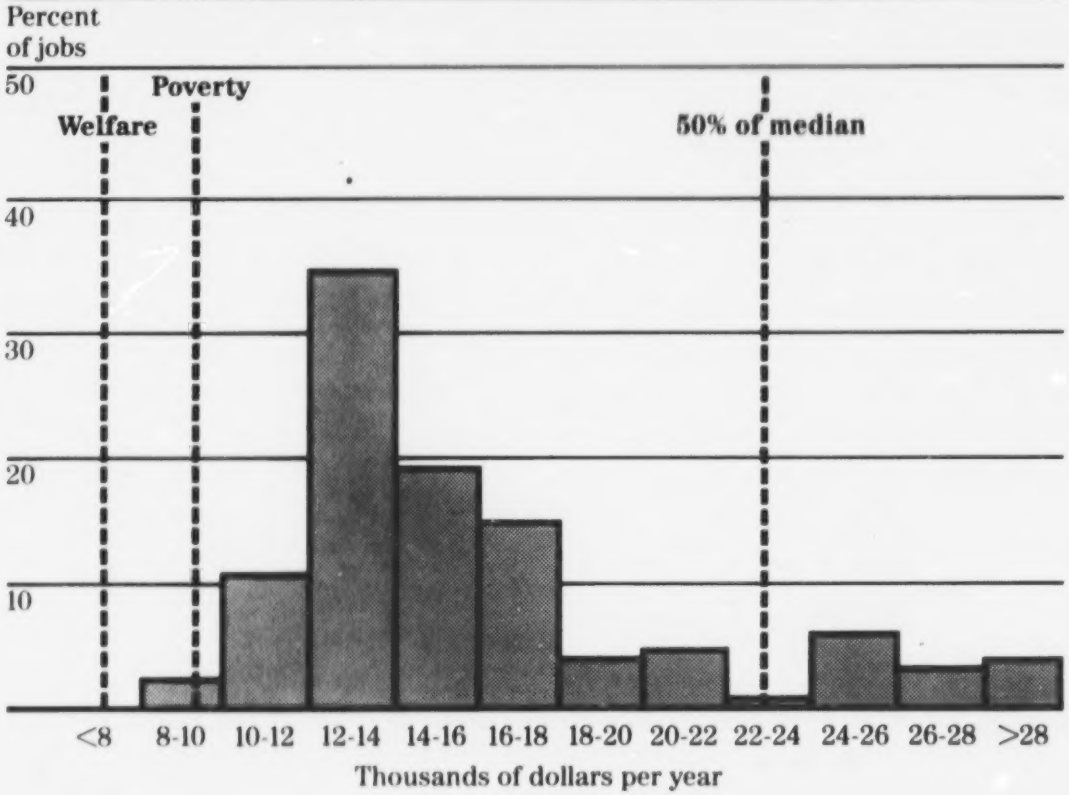
[35]Furthermore, it must be remembered that the comparison made to public assistance here is for the one group of low-income people for whom society provides substantial public assistance (families with dependent children). For low-income people who are childless, the conclusion holds even more strongly: Almost any full-time employment provides more income than public assistance.

Figure 3

Annual earnings at eventual wages for Washington-area jobs not requiring high school graduation



Source: See text and Appendix C

Other indicators of job quality

Table 7 profiles four dimensions of job quality apart from wages.

Table 7
Dimensions of job quality other than wages for Washington-area nongraduate jobs

Dimension of job quality	Percent of jobs
Full-time hours	79%
Ratio of eventual salary to starting salary	
<1.6	67%
1.7 - 2.2	27
>2.2	6
Total	100%
Average job duration	
<1 year	35%
1 - 2 years	60
≥2 years	5
Total	100%
Coverage by employer-provided health insurance	42%

Source: See text and Appendix C.

Part-time employment

The annual incomes in Figures 2 and 3 were based on full-time hours. This overlooks the fact that not all nongraduate jobs examined in this report are offered as full-time positions.[36] The first section of Table 7 shows that about 79 percent of the jobs are full time, leaving 21 percent part time. Because of data limitations (described in Appendix C) this estimate of part-time jobs should be considered the lower limit of the actual number; at least 21 percent are part time. For some occupations (such as child care or fast food worker) 40 percent or more of the positions are part time.

[36]It also overlooks the fact that some potential job-seekers among the chronically poor might take only part-time positions.

Advancement opportunities

One way to measure the opportunities for advancement which an occupation offers is by the ratio of eventual wages to starting wages. Even jobs which pay modestly to start may be attractive if, through opportunities to learn and to establish contacts, they can lead to substantially higher wages in the long run. The second section of Table 7 shows this ratio for nongraduate jobs. Two-thirds of these jobs (67 percent) offer eventual wages which are no more than 60 percent higher than starting wages (for example, a job paying $4.00 per hour to start which, when fully developed, still pays less than $6.40 per hour). The remaining one-third offer greater advancement opportunities. However, only a small proportion of jobs offer workers the opportunity to double their initial wages; only six percent offer a ratio exceeding 2.2.

Job stability

The third section of Table 7 shows how long workers stay in nongraduate jobs. No distinction is made between workers voluntarily leaving and layoffs or firings.

The table shows that 35 percent of nongraduate jobs have very high turnover, with positions lasting, on average, less than one year. Another 60 percent have average job durations of one to two years; only five percent of nongraduate jobs (in such occupations as postal clerk and utility meter reader) enjoy average tenures of more than two years. The nongraduate labor market is one in which long careers with one employer are very much the exception rather than the rule. In fact, very high turnover positions (in occupations such as laborer and fast food worker) dominate the market to an even greater extent than these data show. Jobs less than one year long account for 35 percent of all nongraduate positions. However, they account for 60 percent of nongraduate job openings available at any one time.[37]

Health insurance

After wages, perhaps the most important form of compensation which many workers hope to receive from employment is health insurance. Unfortu-

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[37]Appendix C describes how this estimate was generated.

nately, information reporting the provision of health insurance by employers to workers in specific occupations is scant.

The data in Table 7 show that slightly fewer than half (42 percent) of nongraduate jobs offer some form of employer-financed health insurance, leaving 58 percent offering no such coverage.[38] It is likely that the actual extent of coverage is less than these data indicate (for methodological reasons discussed in Appendix C); therefore, the actual degree of coverage should be considered to be less than 42 percent. In some occupations (such as messenger, vendor, and farm laborer) as few as five percent of workers typically enjoy employer-financed health insurance.

[38]These data refer only to whether or not an employee is eligible for some form of employer-financed health insurance. They indicate nothing about the extent of coverage, along such dimensions as whether employee contributions are required, whether workers' dependents are covered, and whether payments are subject to copayments and deductibles.

VI. GETTING THE GOOD JOBS

The 309 occupations offering nongraduate openings in the Washington area vary considerably in both job quality and job prerequisites. We now turn to the link between these. How much can altering potential workers' qualifications enhance their potential earnings?

Job earnings and job prerequisites

Across the job market there is a strong relationship between an occupation's earnings and the credentials which workers must have to enter the occupation. Thus, nationwide in 1984, the median income of households where the householder had a college degree was $36,700; where the householder was a high school graduate, it was $24,000; and where the householder had dropped out of elementary school, it was $13,900 (U.S. Bureau of the Census, 1986, p. 438; see also Cohn, 1972 and Thurow, 1970).

Table 8 shows a parallel relationship between job qualifications and potential earnings for nongraduate jobs.[39] Holding other factors constant, occupations requiring higher credentials pay substantially higher eventual wages.[40] Specifically:

- Jobs for which employers prefer high school graduates pay an average of 19 percent higher in eventual wages. This difference corresponds to an extra $2,725 per full-time work year.
- Jobs for which prior experience is required pay an extra $2,746 per year.

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[39]The figures in this table are derived from our data on the characteristics of the 309 nongraduates occupations through the statistical technique of multiple regression analysis. This analysis is documented in Appendix D of this report.

[40]Table 8 provides estimates of the impact of credentials on the level of eventual wages. The statistical analysis in Appendix D reveals that parallel results hold for five other dimensions of job quality as well: the level of starting wages, the ratio of eventual wages to starting wages, the proportion of jobs which are full time, job stability, and the probability that the job provides employer-financed health insurance.

Table 8
The relationship between eventual wages and job prerequisites for Washington-area nongraduate jobs

Prerequisites	Average Eventual Wages ($/hour)*
Average of all nongraduate jobs	$7.55
High school graduates preferred	
No	7.03
Yes	8.34
Experience required	
No	7.10
Yes	8.42
Level of language development (defined in Table 3)	
One	7.47
Two	8.38
Three	7.67
Four	6.96
Level of mathematical development (defined in Table 4)	
One	7.23
Two	7.51
Three	7.77
Four	8.01
Vocational training time (defined in Table 5)	
≤ 1 month	6.48
≤ 3 months	6.48
≤ 6 months	6.68
≤ 1 year	7.11
≤ 2 years	7.76
≤ 4 years	8.63

Source: See text and Appendix D.

*Holding other factors constant at their average values.

- Jobs requiring level two language skills[41] pay an extra $1,893 more per year than do those requiring only level one skills.
- Each additional level of mathematical skill required raises average eventual earnings $541 per year.
- Jobs requiring as much as four years of vocational training pay an average of $4,472 per year more than those learned in one month or less.

From such data, it is clear that better credentials are at least one element of a strategy to get better-paying jobs.

Two illustrative examples

Let us consider what employment prospects actually look like for job-seekers among the chronically poor. We shall use two hypothetical examples.

A worker with very limited credentials

Consider, first, a worker who has credentials at or near the bottom of our range. He or she is a high school dropout with only elementary level language and math skills, no work experience, and no vocational training. This person would like to find a full-time job with health insurance coverage, lasting at least a year. He or she lives in the District without a car; jobs in the outer suburbs are not accessible. Out of the pool of 584,000 nongraduate jobs, how many are actually available to such a person?

The answer is 47,000, or eight percent of the total. These jobs would generate approximately 500 openings a week; 166 of the openings would be publicly announced. Given the 3.6 million people in the Washington metropolitan area, the number of applicants competing for those 166 openings could be substantial.

Because of this worker's limited credentials, the jobs open to him or her would represent only 42 among the 309 nongraduate occupations. They come from four broad occupational groups: janitors and cleaners; unskilled

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[41]The levels of skills referred to in these estimates are defined in Tables 3 through 5.

laborers; unskilled and semiskilled factory jobs; and other unskilled service jobs. The starting wages for such jobs average $4.41 per hour ($9,170 per year), and eventual wages average $7.17 per hour ($14,914 per year).

A worker with stronger credentials

In contrast, consider a person who, while not having finished high school, offers stronger job credentials. He or she has high school level math and language skills, some work experience, and more than six months of vocational training. He or she lives in the District but has access to a car. Most important, he or she has some contacts in circles where job information is informally distributed. Like the previous worker, he or she is looking for a full-time job with health insurance coverage, lasting at least one year. The job prospects for this worker are considerably better. Along with the 166 positions described above, another 37 occupations, 10,000 jobs, and 240 openings per week are available. Seventy percent of these additional prospects are skilled factory jobs; the rest are skilled service jobs. Starting wages for these occupations average $7.66 per hour ($15,933 per year), and eventual wages average $13.19 per hour ($27,434 per year).

Gender and racial barriers

While these examples illustrate a clear relationship between better credentials and better jobs, it is important to recognize that improved credentials do not guarantee improved job access. Many of the skilled factory jobs and skilled trade jobs available to our second hypothetical worker have historically been held by white men. Suppose our job-seeker is a black woman. Are her employment prospects as good as we have just suggested? It would be naive to assume so.

Table 9 shows how much a worker's race and sex affect the number and quality of nongraduate jobs available to him or her. It identifies the

number of and eventual wages associated with jobs where women and minority groups traditionally work in substantial numbers.[42]

Table 9
Job openings and wages for Washington-area job-seekers without high school diplomas, by minority status and gender

Minority status and gender of job-seeker		Percent of figure for all groups
	Number of jobs in occupations in which substantial numbers of this group are historically found	
White male	277,000	47%
Minority male	319,000	55
White female	328,000	56
Minority female	438,000	75
All groups	584,000	100%
	Average eventual wages associated with these jobs ($ per hour)	
White male	$8.55	113%
Minority male	8.20	109
White female	6.93	92
Minority female	6.79	90
All groups	$7.55	100%

Source: See text and Appendix C.

The top panel shows how many among the 584,000 nongraduate jobs are historically open to people in each of the four groups. Each of the groups is largely absent from at least one-quarter of the jobs. Nevertheless, many jobs remain open to each group. The group with the smallest number of traditional opportunities -- white males -- still faces some 227,000

[42]For example, household maid is one occupation in which minority women historically work, while the skilled construction crafts are occupations in which white men traditionally work and white women traditionally do not. Among our 309 non-diploma occupations, only 104 (34 percent) were judged to be historically accessible to members of all races and both sexes. For more on the process of assigning these designations, see Appendix C.

potential job opportunities without venturing outside traditional minority status or gender boundaries.

The significance of race and sex becomes clear when we consider the average eventual wages associated with the job categories. Jobs traditionally held by minority women pay an average of $6.79 per hour, while those traditionally held by white men pay an average $8.55 per hour; this difference represents $3,660 per full-time year. The disparity between white women and white men is $3,370 per full-time year, while the disparity between minority men and white men is $728 per full-time year.

VII. CONCLUSIONS AND POLICY IMPLICATIONS

Summary of research findings

To summarize our profile of nongraduate employment opportunities we review the number of jobs available, barriers to getting the jobs, the quality of the jobs themselves, and the relationship between workers' credentials and job quality.

The number of available jobs

In the Washington area, 309 occupations offer at least some openings for people without high school diplomas. These occupations encompass 584,000 jobs (30 percent of all employment), and offer 14,000 openings in an average week.

Barriers to getting the jobs

The above numbers overestimate the jobs available to many of the chronically poor, for three reasons.

First, prerequisites may stand between job-seekers and jobs even for nongraduate openings. For example, among jobs not requiring high school graduation, employers still prefer high school graduates for 30 percent of the openings. Sixty-two percent of the jobs require more than a month of vocational training. Sixty-nine percent require more than the most basic language skills. Thus, only a subset of the opportunities are available to people with very limited education, training, or work experience.

Second, only a fraction -- perhaps as few as one-third -- of the estimated 14,000 vacancies per week are widely advertised. Most job openings are made known only to a limited range of potential applicants. Because many of the chronically poor are not part of these contact networks, their opportunities are severely limited.

Third, race and sex discrimination limit the number and quality of jobs available to chronically poor people who are females or members of minority groups.

Job quality

In the Washington area currently, the average starting wage for nongraduate jobs is $4.57 per hour, or $9,505 per full-time year. Only one-third of these jobs offer starting wages which exceed the official federal poverty level for a prototypical family of one adult and two children. At least 58 percent of the jobs offer no employer-financed health insurance.

The wages a typical worker eventually earns in the average nongraduate job are $15,704 per year, providing a standard of living above the federal poverty level. However, many nongraduate jobs' wages stagnate well below the average; two-thirds of all these jobs' wages never rise more than 60 percent above their starting level. Moreover, long-term job continuity is unusual for nongraduate jobs. Sixty percent of the job openings which occur in a typical week lead to a job lasting less than one year.

The relationship between credentials and earnings

An alternative for workers with limited qualifications employed in jobs with limited wages and advancement opportunities is to increase their qualifications and thereby switch to a more attractive occupation. The 309 occupations vary considerably; some stagnate at $10,000 or less per year, while others increase to $20,000 or more. Much of the variation directly relates to the workers' credentials.

Policy implications

From these facts, a number of policy implications can be drawn concerning the potential role of employment in assisting people to leave poverty.

The relevance of employment to the reduction of chronic poverty

The first implication derives from the association between the substantial employment opportunities described in this report and the current state of the Washington economy, with high growth and low overall unemployment. In prosperity, it is much more feasible for the unemployed, recipients of public assistance, and persons with minimal labor market qualifications to find jobs than it is during a recession or in an economically declining locale. In the Washington area currently, there is a "window of opportunity" in which job openings are relatively available even to people with minimal educational preparation.

Despite prosperity, employment is not immediately practical for all the chronically poor. Nor do the jobs available to them always pay well enough or remain stable enough to offer an immediate and permanent escape from poverty. Nevertheless, in the current Washington economy, it is realistic to place somewhat increased emphasis on employment as an approach to improving the incomes and life chances of the chronically poor. For example, in public assistance programs such as Aid to Families with Dependent Children (AFDC), many states across the nation are strengthening requirements that benefit recipients accept jobs or engage in job-seeking or work-preparation activity; in the labor market described in this research, these strengthened requirements -- if well designed and implemented -- are reasonable and potentially useful.

Actions to reduce barriers to employment

Three major barriers restrict the job openings available to the chronically poor, particularly for better jobs. Actions by government, employers, and other institutions in the community, if well designed and implemented, can reduce these barriers. Specifically:[43]

- In relation to a lack of educational and skill qualifications for employment, potentially effective and cost-effective approaches include remedial education to enhance basic reading, language, and arithmetic skills; high school completion or G.E.D. programs; work-readiness or work experience programs which enhance the social and personal preparation of potential workers; and apprenticeships and other vocational training programs which provide occupational skills and credentials. It is important not only that these programs effectively equip job-seekers with the skills which employers seek but that employers perceive that the preparation is of acceptable quality.

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[43]For more on the design of efficient and effective employment and training programs, see Gueron (1987), Betsey et al. (1985), Taggart (1981), and Bendick (1987).

- In relation to lack of information about available vacancies, potentially useful approaches include active recruiting by employers in inner-city areas, at inner-city schools, or via community-based organizations in the inner-city; more extensive listing of vacancies with the public Job Service; more newspaper advertising of vacancies; improved placement relationships between employers and public training programs; and training of potential workers in techniques of job-seeking.
- In relation to race and gender discrimination, one important approach involves continuing efforts to enforce anti-discrimination provisions already in the law. Other potentially useful approaches include vocational guidance efforts which broaden the occupational aspirations of potential workers and educational efforts with employers to expand their willingness to consider "nontraditional" job candidates.

Investment in such actions is one important means by which "an increased emphasis on employment," referred to in the previous policy implication, might usefully be implemented.

The importance of occupational upgrading

The other way in which an increased emphasis on employment might be implemented is through immediate job placement.

The limitation of this approach is that the jobs readily available to persons with limited employment qualifications are not generally those which eventually pay relatively attractive wages. That is, the jobs accessible to these persons when they first enter the labor market are usually not the first rungs of career ladders where increasing seniority, skills, and experience lead to substantially higher earnings. Instead, the jobs tend to be "dead ends."

To move beyond these jobs often requires two things: improving the qualifications which the worker has to offer and then leaving the occupation in which the worker has found initial employment. Entry level jobs

help in the advancement process by providing the opportunity to establish a steady work history. However, the majority of the credentials required for advancement must be obtained outside of entry-level employment.

The implication is that a successful approach to reducing poverty through employment cannot consist solely of efforts which move persons not currently employed into entry-level jobs. A second focus must be the upgrading of workers' qualifications. Depending on the personal circumstances of the worker and on the state of the local labor market, it might be appropriate to provide upgrading to some workers before they become employed and to others in parallel with entry-level employment.[44]

Without occupational upgrading, an increased emphasis on employment among low-credential workers would do little to reduce chronic poverty. Instead, it would simply convert many of the "welfare poor" into the "working poor."

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[44]Many of the approaches outlined in the previous policy implication -- including completion of high school diplomas, occupational training, vocational guidance, and placement assistance -- are relevant to both employed people and those not currently employed. However, these services may have to be adapted to serve the already-employed -- for example, by scheduling training classes outside of work hours.

APPENDIX A: OCCUPATIONS OFFERING JOBS TO PEOPLE WITHOUT HIGH SCHOOL DIPLOMAS IN THE WASHINGTON AREA

Table A-1 lists 309 occupations which offer at least some job vacancies in the Washington metropolitan area for people without high school diplomas. For each occupation, the table estimates the number of Washington-area jobs that will be available in 1990 and the number of vacancies that will arise during an average week. These estimates are used throughout this report to represent the current local labor market.

These data were developed from estimates prepared by the District of Columbia Department of Employment Services (DOES, 1985). The sources and process applied in the development are documented in Appendix C.

Table A-1
309 occupations offering nongraduate jobs in the Washington area

	Number of jobs	Number of vacancies in an average week
Dance instructors	370	16
Actors or actresses	73	3
Athletes	56	2
Sports instructors	50	2
Umpires	57	2
Athletic trainers	57	2
Dancers	10	0
Musicians, instrumental	1,360	59
Singers	10	0
Music directors	10	0
Television camera operators	37	1
Photographers	500	7
Group recreation workers	1,425	62
Community organization workers	463	11
Managers, auto service dept.	226	6
Managers, auto parts dept.	133	3
Sales clerks	18,721	359
Vendors	40	1
Contribution solicitors	750	11
Crating & moving estimators	220	3
Sales clerk supervisors	393	8
All other sales workers	13,210	253
Typists	12,990	142
Duplicating machine operators	1,030	36
Keypunch operators	1,888	66
Cashiers	11,282	216
Desk clerks	683	29

Table A-1 (Continued)
309 occupations offering nongraduate jobs in the Washington area

	Number of jobs	Number of vacancies in an average week
Order clerks	1,475	28
Ad clerks, newspaper	40	1
Dispatchers	616	11
Production clerks	666	12
File clerks	2,198	24
Postal mail carriers	6,530	31
Mailhandlers, except postal service	982	34
Messengers	2,030	71
Meter readers	650	4
Postal service clerks	7,770	37
Shipping & receiving clerks	2,398	46
Shipping packers	1,042	20
Gas dispatchers	8	0
Crew schedulers	8	0
Meter readers, taxi	8	0
Stock clerks, stockroom, warehouse, etc.	4,575	87
Yard clerks	7	0
Telegraph operators	75	0
Switchboard operators	1,459	16
Central office operators	360	2
Service observers	18	0
Weighers, recordkeeping	25	0
Call-out operators	54	1
General clerks, office	24,469	267
In-file operators	18	0
Protective signal operators	54	2
Film bookers	18	1
All other office clerical workers	11,502	125
All other plant clerical workers	1,632	30
Carpenters	3,453	120
Picture-framers	50	1
Bricklayers	1,086	38
Stonemasons	93	3
Refractory materials repairers	10	0
Logging tractor operators	75	2
Cement masons	556	24
Concrete wall grinder operators	10	0
Concrete rubbers	10	0
Concrete stone finishers	10	0
Terrazzo workers	10	0
Streetlight repairers, servicers	30	0
Excavating, grading machine operators	1,459	62
Painters, maintenance	1,710	26
Paperhangers	25	0
Plasterers	90	3

Table A-1 (Continued)
309 occupations offering nongraduate jobs in the Washington area

	Number of jobs	Number of vacancies in an average week
Plumbers & pipefitters	1,881	66
Roofers	270	9
Structural steel workers	210	9
Tile setters	87	3
Ceiling tile installers, floor-layers	176	8
Blue-collar-worker supervisors	10,790	200
Blacksmiths	14	0
Heat treaters, annealers, etc.	14	0
Job & die setters, metal	14	0
Machining occupations	696	10
Millwrights	220	4
Molders, metal	14	0
Pattern & model makers	14	0
Sheetmetal workers	1,099	15
Toolmakers & diemakers	50	1
Refrig. mechanics, a/c mechanics	1,199	26
Auto seat cover, top installers	100	3
Autobody repairers	569	15
Automotive mechanics	4,552	119
Auto repair service estimators	240	6
Farm equipment mechanics	107	2
Engineering equipment mechanics	456	6
Hydroelectric machine mechanic, etc.	83	0
Mine machinery mechanics	10	0
Marine mechanics/repairers	10	0
Maintenance mechanics	1,106	20
Power transformer repairers	10	0
Treatment plant mechanics	53	0
Electric meter installers, etc.	23	0
Gas & electric appliance repairers	283	2
Household appliance installers	53	1
Water meter installers	23	0
Household appliance repairers	183	3
Radio & TV servicers & repairers	573	10
Drapery hangers	62	1
Bicycle repairers	21	0
Camera repairers	21	0
Electric motor repairers	21	0
Electric tool repairers	21	0
Electric instrument repairers	21	0
Gasoline engine, mower repairers	21	0
Gunsmiths	21	0
Instrument repairers, optical	21	0
Laundry machine mechanics	21	0
Locksmiths	113	2

Table A-1 (Continued)
309 occupations offering nongraduate jobs in the Washington area

	Number of jobs	Number of vacancies in an average week
Coin machine servicers, repairers	117	3
Sewing machine mechanics	21	0
Protective signal installers/repairers	21	1
Instrument repairers	107	2
Diesel mechanics	400	10
Electromedical equipment repairers	21	0
Pinsetter mechanics, automatic	21	0
Sign erectors	72	3
All other mechanics & repairers	1,325	29
Setters, bindery machines	190	2
Bookbinders, machine	910	11
Bindery workers, assembly	770	9
Bindery workers, stitching	60	1
All other bindery workers	1,270	15
Electrotypers, stereotypers	80	1
Engravers, except photoengravers	80	1
Strippers, printing	373	4
Camera operators, printing	313	4
Photoengravers	173	2
Press operators, plate printers	1,180	14
Offset lithographic press operators	4,250	49
Platemakers	510	6
Letterpress operators	820	10
Steel die press operators	210	2
Proof press operators	10	0
Cable splicers	170	1
Line installers, repairers	519	2
Troubleshooters, power line	53	0
Installers, repairers, section maintainers	416	2
Station installers	416	2
Telegraph equipment maintainers	13	0
Frame wirers	103	1
Central office repairers	323	2
Trouble locators, test desk	57	0
Shop repairers, instrument	13	0
Teletype installers	13	0
Bakers	530	9
Cabinetmakers	760	26
Carpet cutters, carpet layers	250	5
Crane, derrick, & hoist occupations	140	6
Merchandise displayers & window dressers	176	3
Furniture finishers	320	5
Glazers	333	5
Jewelers & watchmakers	70	1
Millers, grain, flour, feed	75	1

Table A-1 (Continued)
309 occupations offering nongraduate jobs in the Washington area

	Number of jobs	Number of vacancies in an average week
Motion picture projectionists	420	18
Shoe repairing occupations	160	2
Control room operators, steam	160	1
Auxiliary equipment operators	75	1
Gas-pumping station operators	75	0
Turbine engineers	75	0
Watershed tenders	75	0
Ship engineers	75	2
Stonecutting & carving occupations	25	1
Tailors	1,570	28
Upholstering occupations	310	6
Crafts & kindred workers*	6,830	94
Semiskilled metalworking operators	3,430	47
Metal platers	250	3
Machine tool operators, combination and numerically controlled	420	6
Wood machinists	370	9
Machine tool operators, tool room	85	1
Power press operatives	170	2
Welders & flame cutters	576	8
Semiskilled textile operatives	75	1
Graders, sorters, examiners in manufacturing	60	1
Packers, wrappers, except meat & produce	2,940	55
Other operatives, except transport	30,090	558
Asbestos & insulation workers	260	9
Assemblers	1,235	23
Blasters	75	3
Pressers, hand	120	2
Pressers, machine	870	15
Pressers, machine, laundry	1,170	21
Cutting operatives*	150	3
Sewers, custom	75	1
Drillers, earth	75	3
Drywall installers, lathers	546	19
Filers, polishers, sanders, buffers	75	1
Trailer rental attendants	83	1
Fuel pump attendants, lubricators	5,910	155
Tire changers	150	4
Laundry, dry cleaning operators*	2,960	52
Mine operatives*	75	1
Mixing operatives	170	3
Oilers	75	1
Painters, automotive	710	18
Painters, production	290	5
Other photo process workers	496	7

Table A-1 (Continued)
309 occupations offering nongraduate jobs in the Washington area

	Number of jobs	Number of vacancies in an average week
Riveters & fasteners	75	1
Sailors & deckhands	75	2
Sawyers	75	2
Sewers & stitchers	690	11
Shoemaking machine operators	75	1
Furnace tenders, stokers, except metal	1,440	21
Winding operatives*	25	0
Miscellaneous machine operators, meat & dairy	190	3
Miscellaneous machine operators, all other food	290	5
Miscellaneous machine operators, textile mill	75	1
Miscellaneous machine operators, lumber products	75	2
Miscellaneous machine operators, paper, allied	75	1
Miscellaneous machine operators, chemical, allied	710	6
Miscellaneous machine operators, petroleum, coal	75	1
Miscellaneous machine operators, rubber, plastic	75	1
Miscellaneous machine operators, stone, clay, glass	220	3
Miscellaneous machine operators, primary metals	75	1
Miscellaneous machine operators, manufacturing*	510	9
Miscellaneous machine operators, nonmanufacturing	340	5
Operatives, durable goods*	160	3
Operatives, nondurable goods*	2,130	39
Operatives, nonmanufacturing*	500	7
Bus drivers, school	2,158	20
Delivery and route workers	4,316	83
Forklift, tow motor operators	2,680	51
Parking lot attendants	2,090	73
Tower operators	28	1
Taxi drivers	530	9
Rental car delivery workers	550	19
Chauffeurs	600	11
Truck driving occupations	5,704	108
All other ops. & semiskilled workers	2,717	50
Cleaning service workers	74,490	1,112
Bakers, bread and/or pastry	420	7
Bartenders	4,770	215
Dining room attendants, bar helpers, etc.	7,620	343
Cooks, short-order/fast food	6,120	276
Cooks, restaurant	7,070	319
Cooks, institutional	5,380	133
Butchers and/or meat cutters	2,690	56
Waiters and waitresses	28,580	1,288
Kitchen helpers	11,940	538
Food preparation and service workers, fast food	24,490	1,104
Pantry, sandwich and/or coffee makers	3,050	137

Table A-1 (Continued)
309 occupations offering nongraduate jobs in the Washington area

	Number of jobs	Number of vacancies in an average week
All other food service workers	15,490	698
Health aides, except nursing	100	1
Nurse's aides/orderlies	4,712	64
Psychiatric aides	376	5
Attendants, recreation and amusement	3,190	139
Mortuary workers	180	3
Housekeepers, hotel and motel	1,130	49
Checkroom and locker room attendants	220	4
Baggage, porters and bellhops	1,140	49
Bootblacks	75	1
Child-care workers, except private	828	8
Elevator operators	540	8
Cosmetologists/women's hairstylists	5,840	87
Manicurists	230	3
Shampooers	860	13
Ushers, lobby attendants, ticket takers	1,640	71
Welfare service aides	1,690	42
Crossing guards, bridgetenders	860	6
Guards and doorkeepers	5,914	207
Checkers, fitting room	300	6
Store detectives	356	7
Parking enforcement officers	40	0
Child-care workers, private household	619	6
Cooks, private household	45	0
Housekeepers, private household	450	5
Launderers, private household	45	0
Maids, servants, private household	2,030	21
Supervisors, nonworking service	5,370	80
All other service workers	9,750	146
Animal caretakers	2,550	45
Airhammer operators	60	3
Asphalt heater tenders	60	3
Form setters, metal road form	170	7
Fence erectors	60	3
Pipelayers	800	35
Reinforcing-iron workers	270	12
Highway maintenance workers	1,080	7
Asphalt rakers	460	20
Freight, material handlers	220	4
Garbage collectors	1,550	10
Gardeners & groundskeepers	7,420	111
Tree trimmers	30	0
Timbercutting, logging workers	10	0
Order fillers	926	18
Stock clerks, sales floor	3,806	73

Table A-1 (Continued)
309 occupations offering nongraduate jobs in the Washington area

	Number of jobs	Number of vacancies in an average week
Cleaners, vehicle	2,500	64
Setters and/or drawers	26	0
Shakeout workers, foundry	26	0
Beltmakers, sanding drums	27	0
Furnace operators helpers/heater helpers	27	0
Riggers	160	6
Helpers, trade	4,562	159
Line service attendants	780	35
Forest conservation workers	27	1
Septic tank servicers, etc.	27	1
All other laborers & unskilled workers	32,620	1,048
Farmers & farm managers	7	0
Farm supervisors	30	0
Farm laborers	600	20

*Not elsewhere classified.

APPENDIX B: SELECTED NONGRADUATE OCCUPATIONS OFFERING JOBS OF HIGHER QUALITY

Among the 309 occupations identified in appendix A, the 107 occupations listed in Table B-1 may be of particular interest. They each account for at least 100 jobs for nongraduates in the Washington area and fulfill five standards of job quality:

1. The average starting wage is at least $4.00 per hour.
2. The average eventual wage is at least $7.00 per hour.
3. At least 30 percent of openings offer employer-financed health insurance.
4. At least 75 percent of openings are full-time.
5. The average duration of employment is at least one year.

Together, these occupations encompass 317,000 jobs and 3,000 openings in an average week.

Table B-1
107 nongraduate occupations meeting five standards of job quality

	Number of jobs	Number of vacancies in an average week
Other operatives, ex. transport	30,090	558
General clerks, office	24,469	267
All other office clerical workers	11,502	125
Blue-collar-worker supervisors	10,790	200
Postal service clerks	7,770	37
Gardeners & groundskeepers	7,420	111
Crafts & kindred workers*	6,830	94
Postal mail carriers	6,530	31
Supervisors, nonworking service	5,370	80
Stock clerks, stockroom, warehouse, etc.	4,575	87
Helpers, trade	4,562	159
Offset lithographic press operators	4,250	49
Carpenters	3,453	120
Semiskilled metalworking operators	3,430	47
Packers, wrappers, except meat & produce	2,940	55
All other ops. & semiskilled workers	2,717	50
Butchers and/or meat cutters	2,690	56

Table B-1
107 nongraduate occupations meeting five standards of job quality

	Number of jobs	Number of vacancies in an average week
Forklift, tow motor operators	2,680	51
Shipping & receiving clerks	2,398	46
File clerks	2,198	24
Operatives, nondurable goods*	2,130	39
Plumbers & pipefitters	1,881	66
Painters, maintenance	1,710	26
All other plant clerical workers	1,632	30
Tailors	1,570	28
Garbage collectors	1,550	10
Order clerks	1,475	28
Switchboard operators	1,459	16
Excavating, grading machine operators	1,459	62
Furnace tenders, stokers, except metal	1,440	21
All other mechanics & repairers	1,325	29
All other bindery workers	1,270	15
Assemblers	1,235	23
Refrig. mechanics, a/c mechanics	1,199	26
Press operators, plate printers	1,180	14
Maintenance mechanics	1,106	20
Sheetmetal workers	1,099	15
Bricklayers	1,086	38
Highway maintenance workers	1,080	7
Order fillers	926	18
Bookbinders, machine	910	11
Letterpress operators	820	10
Pipelayers	800	35
Bindery workers, assembly	770	9
Cabinetmakers	760	26
Misc. machine operators, chemical, allied	710	6
Machining occupations	696	10
Production clerks	666	12
Meter readers	650	4
Welders & flame cutters	576	8
Radio & TV servicers & repairers	573	10
Cement masons	556	24
Drywall installers, lathers	546	19
Bakers	530	9
Line installers, repairers	519	2
Platemakers	510	6
Misc. machine operators, manufacturing*	510	9
Operatives, nonmanufacturing*	500	7
Photographers	500	7
Asphalt rakers	460	20
Engineering equipment mechanics	456	6

Table B-1
107 nongraduate occupations meeting five standards of job quality

	Number of jobs	Number of vacancies in an average week
Machine tool operators, combination and numerically controlled	420	6
Station installers	416	2
Installers, repairers, section maintainers	416	2
Strippers, printing	373	4
Wood machinists	370	9
Central office operators	360	2
Misc. machine operators, nonmanufacturing	340	5
Glazers	333	5
Central office repairers	323	2
Furniture finishers	320	5
Camera operators, printing	313	4
Upholstering occupations	310	6
Painters, production	290	5
Misc. machine operators, all other food	290	5
Gas & electric appliance repairers	283	2
Reinforcing-iron workers	270	12
Roofers	270	9
Asbestos & insulation workers	260	9
Metal platers	250	3
Carpet cutters, carpet layers	250	5
Crating & moving estimators	220	3
Misc. machine operators, stone, clay, glass	220	3
Freight, material handlers	220	4
Millwrights	220	4
Steel die press operators	210	2
Structural steel workers	210	9
Misc. machine operators, meat & dairy	190	3
Setters, bindery machines	190	2
Household appliance repairers	183	3
Ceiling tile installers, flor layers	176	8
Photoengravers	173	2
Form setters, metal road form	170	7
Mixing operatives	170	3
Power press operatives	170	2
Cable splicers	170	1
Operatives, durable goods*	160	3
Shoe repairing occupations	160	2
Control room operators, steam	160	1
Riggers	160	6
Cutting operatives*	150	3
Crane, derrick, & hoist occupation	140	6
Coin machine servicers, repairers	117	3
Locksmiths	113	2
Farm equipment mechanics	107	2

Table B-1
107 nongraduate occupations meeting five standards of job quality

	Number of jobs	Number of vacancies in an average week
Instrument repairers	107	2
Frame wirers	103	1

*Not elsewhere classified

APPENDIX C: METHODOLOGY USED TO DERIVE ESTIMATES OF JOBS AND JOB CHARACTERISTICS

Estimates of total employment

As part of its responsibility to provide labor market information for the city, the District of Columbia Department of Employment Services (DOES) periodically produces ten-year forecasts of employment by occupation and by industry for the Washington metropolitan area. These forecasts are generated under contract to DOES by the Department of Labor of the State of Maine, utilizing standardized methodology and assumptions developed by the federal Bureau of Labor Statistics.[45] At the time of this report, the most recent forecast available was for 1990.

These projections are conservative. They assume that employment in the year for which the projections are being created will parallel employment in the year from whose actual employment the projections are being made, with patterns changing only slowly as part of well-established national trends in the demand for outputs of industries and the technology of production.

DOES forecasted 1,963,970 jobs for the Washington metropolitan area in 1990, spread over 882 occupations (DOES, 1985, pp. 19-40). According to DOES, this total has a forecast error of two percent.

Determining whether a high school diploma is required

It was then necessary to determine which of the occupations in these projections were open to people without high school diplomas. We did so in three steps:

1. The Occupational Outlook Handbook (U.S. Department of Labor, 1986) is a standard reference work on the present and future outlook for a variety of occupations in the American economy. Based on detailed analyses of employment practices across the nation, it provides essays describing broad occupational groups. For each of the 882 occupations involved in the DOES forecasts for 1990, our first step was to check whether the

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[45]For a description of parallel projections by the Bureau of Labor Statistics for the nation as a whole, see Silvestri and Lukasiewicz (1985).

Handbook stated that a diploma was essential, preferred but not essential, or not generally required.

2. The Handbook does not discuss a number of the 882 occupations. Also, it reflects nationwide practices. Since the labor force in the Washington area is better educated than that in many other areas of the country, occupations not requiring a diploma elsewhere may require one here. We therefore supplemented information from the Handbook with information from four additional sources:
   (a) We consulted a variety of local published sources such as Metropolitan Washington Occupational Outlook (Department of Employment Services, 1981) and Handbook of Licensed Occupations in the District of Columbia (District of Columbia Occupational Information Coordinating Committee, 1983).
   (b) We examined job vacancy announcements in the classified section of the Washington Post.
   (c) We telephoned the personnel departments of major employers in the Washington area, asking whether they required high school diplomas for various entry-level positions. For example, concerning bank tellers, we telephoned several major local banks; concerning school bus drivers, we contacted one large school district.
   (d) We visited a local office of the District of Columbia Job Service to review the prerequisites for current job vacancies.
3. With the information gathered from all these sources, we then made a final determination for each occupation as to whether, in the current Washington-area labor market, a diploma is required, preferred but not required, or not required and not preferred. Three hundred nine occupations remained in the latter two categories. These 309 are the occupations listed in Appendix A and analyzed throughout the report.

Estimating the number of jobs and vacancies

For each of these 309 occupations, we then entered into our data base a number of jobs projected for 1990. For occupations judged to neither require nor give preference to graduates, this number was simply the total number projected by the DOES. For occupations in which we had judged that high school graduation was preferred, we arbitrarily reduced the number of jobs to one-third of the DOES number. The resulting total of 583,751 is listed, occupation by occupation, in the second column of Table A-1 in Appendix A.

The number of vacancies generated by each occupation in a typical week (which is the number in the third column of Table A-1) was calculated by dividing the total jobs for each occupation by the average duration of the jobs (a figure whose derivation is described later) and dividing again by 52 weeks per year.

It should be noted that this calculation captures only the number of openings which would occur in an occupation for which total demand was stable. It therefore underestimates the number of openings in growing occupations and overestimates the number of openings in shrinking occupations.

Analysis of other prerequisites

To profile other prerequisites required for entry into an occupation, we relied upon analyses by the U.S. Bureau of Labor Statistics, reported in Selected Characteristics of Occupations Defined in the Dictionary of Occupational Titles (U.S. Department of Labor, 1981). This attributes to each occupation[46] several coded variables representing the levels of mathematical development, language development, lifting capability, and vocational training required to function fully in each occupation.

Each of the 309 occupations was also assigned a score of 1 or 0 depending upon whether previous experience was generally required for

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[46]Occupations are listed in the federal Dictionary of Occupational Titles and its related documents under a set of titles and codes which differ from the set used in DOES (1985). It was necessary to translate between the two using an unpublished "crosswalk" provided to us by a federally sponsored national service center for occupational coding operated by the Department of Labor of the state of Iowa.

entry. This assignment was done judgmentally by the authors, guided by the same range of sources used to determine whether a high school diploma was required. It was assumed that prior experience was required for all skilled craft jobs and for all supervisory jobs.

Analyzing the location of employment

We divided the Washington metropolitan area into nine jurisdictions: District of Columbia; Montgomery County, Prince George's County, Arlington County, and the city of Alexandria (which we considered together as the inner suburban ring); Loudon County, Prince William County, Fairfax County, and Charles County (which we considered together as the outer suburban ring).

The only data available concerning the geographic distribution of employment in the Washington area was that produced by the Metropolitan Washington Area Council of Governments (1986); we used the projections for the year 1990. These data refer to all employment, rather than nongraduate employment.

Estimates of wage levels

This report analyzes two wage levels for each occupation -- a starting wage and an eventual wage. The starting wage is the wage paid to someone taking their first job in the occupation. The eventual wage represented the amount an average experienced worker could expect to earn after obtaining all the necessary credentials, accumulating substantial experience, and becoming established in the occupation.

No single source provided numbers for each occupation tailored specifically to the Washington labor market. Therefore, wages for each occupation were judgmentally estimated by the authors, based on information obtained from a variety of published and unpublished sources, including The Occupational Outlook Handbook, other local documents, advertisements in the Washington Post, and vacancy listings with the D.C. Job Service. In addition, we consulted both national and local-area wage surveys produced for selected occupations by the federal Department of Labor or by the departments of employment of the District of Columbia, Maryland, and Virginia (Department of Employment and Training, 1985; Department of

Employment Services, 1981; U.S. Department of Labor, 1986a; U.S. Department of Labor, 1986d; and U.S. Department of Labor, 1986f).

Full-time and part-time employment

The U.S. Bureau of Labor Statistics has derived estimates from its nationwide Current Population Survey (CPS) in 1986 of the proportion of jobs which are full time (more than 35 hours per week) for nine broad occupational categories. These estimates were provided to us in unpublished form by Mr. Thomas Nardone of the U.S. Bureau of Labor Statistics. Each of the 309 occupations was assigned the proportion estimated for its broader category. Because each of the broad categories mixes nongraduate jobs with higher-level jobs and because part-time jobs tend to be more common among lower-level jobs, the resultant figures probably overestimate the proportion of full-time jobs.

Job duration

No single source was available estimating the duration of employment associated with different occupations or differentiating between turnover initiated by employees and involuntary turnover. Accordingly the authors judgmentally estimated average job durations using the most recent national statistics (Cohen and Schwartz, 1980, plus related unpublished data), which provide quarterly separation rates for each of fifty industries.

Health insurance

Published data on fringe benefits, including health insurance, is generally available by industry (U.S. Department of Labor, 1986c; U.S. Chamber of Commerce, 1986) but not by occupation. The estimates in Table 7 of this study are from unpublished tabulations from the Current Population Survey of March 1986, provided by Katherine Swartz of The Urban Institute, Washington, D.C. These tabulations estimate the proportions of employees covered by employer-financed health insurance for nine broad occupational groups. The authors assigned the proportions of the broad groups to each of the 309 occupations for all full-time positions. For part-time positions and for self-employed occupations (e.g., street vendors), we assumed no employer-financed health insurance.

The broad categories mix nongraduate jobs with higher-level jobs. Because health insurance coverage is more common among higher-level jobs, the resultant figures overestimate the proportion of nongraduate jobs which are covered by employer-financed health insurance.

Estimating the wage impact of discrimination

Section VI of the report uses the concept of occupations in which jobs are traditionally held by members of different races and sexes.

1. For determining whether an occupation is traditionally gender-restricted, a single data source, reflecting nationwide data, was used: Time of Change: The 1983 Handbook on Women Workers (U.S. Department of Labor, 1983). Table II-3 of that document reports women as a proportion of total employment in a wide range of occupations. An occupation was coded female if that proportion exceeded 80 percent and male if the proportion was under 20 percent. Occupations falling in between were coded as neither.
2. For determining whether an occupation was traditionally restricted on the basis of minority status, no single data source covering a wide range of occupations was available. Accordingly, each occupation was coded judgmentally, guided by published data where available (for example, Payton, 1984, Table 3.1). Each occupation was coded as traditionally minority, traditionally non-minority, or neither.

Data reported in Table 9 for each of the four gender or minority groups represent totals and averages for occupations either associated with that group or not restricted. Thus, for example, the figures for black women reflect occupations with black women heavily represented, plus occupations with women heavily represented, plus occupations with minorities heavily represented, plus occupations which are neutral with respect to both race and sex.

APPENDIX D: STATISTICAL REGRESSION ANALYSIS

To estimate the impact certain job characteristics have on eventual wages (see Section VI), we used the statistical technique of multiple regression. In this analysis, each of the 309 nongraduate occupations was treated as one observation.

The regression coefficients estimated in this analysis are presented in Table D-1. To generate the figures reported in Table 8, the coefficients reported in the first data column of Table D-1 are multiplied by the appropriate values of the variable being analyzed, while holding all other variables in the regression equation at their average values.

Parallel regression equations (in terms of independent variables) were estimated with six different dependent variables: eventual wages, starting wages, the ratio of eventual to starting wages, the proportion of full-time jobs, the proportion of jobs with health coverage, and the average job duration. The general parallelism of the resulting regression coefficients is the basis for our conclusion that the positive relationship between eventual wages and job prerequisites also holds for other dimensions of job quality.

Table D-1
Regression analysis of the relationship between indicators of job quality and job characteristics

Independent Variable	Dependent Variable: Eventual Wage ($/hour)	Starting Wage ($/hour)	Ratio Eventual/ Starting	% Jobs Full Time	Health Insurance (% of jobs)	Job Duration (years)
Intercept	$5.89*	$3.63*	3.26**	79.0%**	47.2%*	1.08
	(2.21)	(1.23)	(0.35)	(8.1)	(23.0)	(1.03)
Graduate preferred	1.19**	.62**	.06	2.7*	1.0	.01
	(.31)	(.18)	(.05)	(1.1)	(3.2)	(.15)
Mathematical development	.31	-.19	.20	-4.1	-2.1	-.09
	(.97)	(.54)	(.15)	(3.5)	(10.1)	(.46)
Mathematical squared	-.01	.05	.05	.01	.8	.05
	(.19)	(.1)	(.03)	(.06)	(1.9)	(.09)
Language development	1.18	.77	.05	1.0	9.7	0.75
	(.8)	(.45)	(.13)	(3.0)	(8.4)	(.38)
Language squared	-.27	-.21**	-.001	-.8	-2.6	-.16*
	(.14)	(.08)	(.02)	(.5)	(1.5)	(.07)
Vocational training	-.56	.12	-.13	3.4*	10.8*	.14
	(.44)	(.24)	(.07)	(1.6)	(4.6)	(.21)
Vocational squared	.11*	.01	.02**	-.2	-1.1*	-.01
	(.04)	(.02)	(.006)	(.1)	(.4)	(.02)
Experience	1.32	.9**	.04	6.1**	-5.5	-.3
	(.39)	(.23)	(.06)	(1.5)	(4.1)	(.18)
Strength	.02	.11	-.001	-4.9*	-15.3	-.59
	(.5)	(.28)	(.08)	(1.9)	(5.3)	(.23)
Strength squared	-.06	-.06	.01	1.2**	2.9*	.08
	(.14)	(.08)	(.02)	(.5)	(1.4)	(.07)
Environmental hazards	.64*	.23	.09	3.4**	9.9*	.13
	(.31)	(.17)	(.05)	(1.1)	(3.2)	(.14)
Environmental squared	-.15	-.05	-.02	-.5	-1.4	-.02
	(.08)	(.05)	(.01)	(.3)	(.8)	(.04)

Table D-1 (continued)
Regression analysis of the relationship between indicators of job quality and job characteristics

Independent Variable	Dependent Variable: Eventual Wage ($/hour)	Starting Wage ($/hour)	Ratio Eventual/ Starting	% Jobs Full Time	Health Insurance (% of jobs)	Job Duration (years)
Physical requirements	.32 (.57)	-.05 (.31)	--	.3 (2.1)	-10.0 (5.9)	-.31 (.28)
Physical squared	-.04 (.1)	.01 (.05)	--	-.2 (.4)	1.1 (1.0)	.08 (.05)
Traditional non-minority	.5 (.39)	-.09 (.22)	.11 (.06)	-.01 (1.4)	.4 (4.0)	-.51* (.18)
Traditional male	1.42** (.25)	.81** (.14)	.12** (.04)	5.6** (.9)	9.1* (2.6)	.45** (.12)
Starting wage	--	--	-.55** (.11)	--	--	--
Starting squared	--	--	.035** (.008)	--	--	--
R-squared	.6	.54	.31	.48	.17	.15
Number of observations	309	309	309	309	309	309
Degrees of freedom	292	292	292	292	292	292

Variables are defined in Appendix D.

* Coefficient is statistically different from zero at .05 level.

** Coefficient is statistically different from zero at .01 level.

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